

ON THE HABIT AND USE OF NARDOO (*MARSILEA
DRUMMONDII*, A.Br.), TOGETHER WITH SOME
OBSERVATIONS ON THE INFLUENCE OF WATER-
PLANTS IN RETARDING EVAPORATION.

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(Communicated by J. H. Maiden, F.L.S., F.C.S.)

I lately had an opportunity to visit the south-western corner of Queensland, journeying there via South Australia and returning eastward across Queensland.

Nardoo was first encountered in quantity near Lake Kopperamana on Cooper's Creek. I learnt that the blacks in that district, and indeed all over the watershed of the Cooper, Diamantina, and Georgina Rivers, still made use of it as in the days of Burke and Wills; and also that the plant is a *Marsilea*, as had been originally stated, but doubted by some, who thought it impossible that sufficient involucre (sporocarps) to serve for food could be obtained from a *Marsilea*, the Nardoo of Burke and Wills being regarded by them as the seed of *Sesbania aculeata*, Pers. I found also that Nardoo did not grow in permanent water nor in swamps; it was no more a water-plant than Lignum (*Muhlenbeckia Cunninghamii*, F.v.M.), Blue-bush (*Chenopodium auricomum*, Lindl.), or Coolibar (*Eucalyptus bicolor*, A. Cunn.), with which it was associated; it grew only on country subject to inundation and never on sand hills or on stony plains. It is perennial in habit, with a creeping rhizome, the growing end of which remains alive even through a drought, and throws up fronds and involucre after rain or after having been irrigated by flood water. I could not satisfy myself that it propagated by spores. The leaves close up at night. The plant is an ornamental one and would be a valuable addition to the fernery.

Windorah, on the Cooper, is the nearest place to Brisbane that I saw it growing; roots which I brought from there grew into vigorous plants outside, but the continuous rain in February last proved too much and they died, only one pot, which was under cover, surviving. In a day one could gather about a hundred-weight of the dried roots with involucre attached, from which perhaps forty pounds of involucre could be picked; ten pounds might easily enough be obtained daily by one person, which amount would be sufficient for a whole camp of blacks. Nardoo is not a wholesome substance eaten alone, but in addition to other food is a useful adjunct.

At Annandale I had the opportunity to witness the gins preparing Nardoo damper. The involucre, which are very hard, are pounded between two stones; a handful of them is held in the left hand and fed to a stone on the ground, a few grains being allowed to drop from the hand by separating, abducting the little finger, a smart blow being struck with a stone in the right hand, which effectually pulverises every grain at once; it is surprising with what rapidity they can do this work. The flour is mixed with water, kneaded to a dough, and baked in the ashes. The civilised blacks, who were supplied with wheaten flour from the station, were not too proud to make and eat Nardoo damper.

To ascertain if floating water-weeds retard evaporation, as has been stated, the following observations and experiments were made. Fresh-water plants, with a few exceptions, will not grow in water deeper than five feet; some few, such as *Nymphaea* and *Nelumbium*, grow in ten feet, and under very favourable conditions in deeper water, but fifteen feet might be taken as the absolute limit that any fresh-water plant, rooting at the bottom, will grow. These large water-lilies require shallow water wherein to establish themselves and extend gradually to deeper water. It would be hard to start them in deep water from the first.

Reservoirs and permanent waterholes are seldom less than ten feet deep, generally more, so that it would be impracticable, even were it desirable, to grow weeds in them. Of course such plants as *Lemna* and *Azolla* might be grown, provided the surface water was not agitated much by wind.

A number of glass cells each of the capacity of one gallon of water were arranged some with and some without water-weeds ; one series was placed outside in the sun, another series in the shade and under cover. Duckweed (*Lemna*), *Azolla*, and the Blue water-lily (*Nymphaea gigantea*, Hook.) were the plants used. From these experiments it was seen that evaporation was neither retarded nor hastened.

Oil floating in a thin layer on the surface, however, hindered evaporation very considerably.

Artificial dams and reservoirs of any kind should of course be made as deep as possible with the object of preventing the water becoming hot, and as presenting the least surface for evaporation.

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